Name: Date:

Polynomial Factoring solution (version 12)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 31 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(31)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 124}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-108}}{2}$$

$$x = \frac{-4 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{-4 \pm 6\sqrt{3}\, i}{2}$$

$$x = -2 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $9 - 4i$ and $3 + 6i$ in standard form $(a + bi)$.**

Solution

$$(9 - 4i) \cdot (3 + 6i)$$

$$27 + 54i - 12i - 24i^2$$

$$27 + 54i - 12i + 24$$

$$27 + 24 + 54i - 12i$$

$$51 + 42i$$

Polynomial Factoring solution (version 12)

3. **Write function $f(x) = x^3 - 11x^2 + 34x - 24$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	-11	34	-24
4		4	-28	24
	1	-7	6	0

$$f(x) = (x-4)(x^2 - 7x + 6)$$

$$f(x) = (x-4)(x-6)(x-1)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7) \cdot (x+4)^2 \cdot (x-1)^2 \cdot (x-5)$$

Sketch a graph of polynomial $y = p(x)$.